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EXAMINER

WASSUM, LUKE S

ART UNIT PAPER NUMBER

2177

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

14

Office Action Summary

Application No.

10/055,586

Applicant(s)

BAR-YOSSEF ET AL.

Examiner

Luke S. Wassum

Art Unit

2177

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-19 is/are rejected.
- 7) ☒ Claim(s) 8 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Applicants' Information Disclosure Statement, filed 28 August 2002, has been received and entered into the record. Since the Information Disclosure Statement complies with the provisions of MPEP § 609, the references cited therein have been considered by the examiner. See attached form PTO-1449.

The Invention

2. The claimed invention is a system and method for cleaning a set of hypertext documents in order to minimize violations of a Hypertext Information Retrieval rule set.

Drawings

3. Receipt of corrected formal drawings, filed 28 February 2002, is acknowledged. These drawings are approved by the examiner.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 4-6 and 16-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Regarding claims 4, 5, 16 and 17, the claims are rendered indefinite because the claims, particularly in light of the specification at page 13, line 10 through page 14, line 4, recite a process that is inconsistent.

At step 610 (Figure 6), the top node is removed from the queue, and is analyzed to determine if the node is a pagelet. However, it is disclosed that one of the criteria of pagelet determination is whether the node has any children that are pagelets. The inconsistency is that at step 612, in order for a pagelet determination to be made regarding node v , all of the nodes children need to undergo the same analysis. However, those nodes are not inserted into the queue for such analysis until *after* it has been determined that node v is not a pagelet, in step 614. Put another way, the child nodes are not pushed onto the queue to determine if they are pagelets until after it is determined that their parent node is not a pagelet, but that determination cannot take place until the child nodes have already undergone this analysis.

7. Claims 6 and 18, incorporating the deficiencies of their respective parent claims, are also rendered indefinite.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 7, 9, 11, 13-15 and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by **Broder et al.** ("Syntactic Clustering of the Web").

10. Regarding claim 1, **Broder et al.** teaches a method as claimed, comprising the step of cleaning, by operations of a computer system, a set of text documents to minimize violations of a predetermined set of Hypertext Information Retrieval rules (see section 1 Introduction, beginning on page 2; see also section 5.1 Common Shingles, beginning on page 7, particularly the disclosure on page 8 that common shingles either have no effect on the overall resemblance of the documents or they have the effect of creating a false resemblance between two basically dissimilar documents, and so common shingles are ignored).

11. Regarding claim 13, **Broder et al.** teaches a computer readable medium including computer instructions for driving a user interface as claimed, the computer instructions comprising instructions for cleaning, by operations of a computer system, a set of text documents to minimize violations of a predetermined set of Hypertext Information Retrieval rules (see section 1 Introduction, beginning on page 2; see also section 5.1 Common Shingles, beginning on page 7, particularly the disclosure on page 8 that common shingles either have no effect on the overall resemblance of the documents or they have the effect of creating a false resemblance between two basically dissimilar documents, and so common shingles are ignored).

12. Regarding claim 9, **Broder et al.** teaches a system as claimed, comprising:

- a) a user interface (see disclosure that the system can be used for filtering the results of Web searches, said web searches requiring a user interface, Abstract);

- b) a user interface/event manager communicatively coupled to the user interface (see disclosure that the system can be used for filtering the results of Web searches, said web searches requiring an event handler to respond to user requests, Abstract);
- c) a generic data gathering device (see disclosure that the system can be applied to a group of documents found by the AltaVista spider, section 1 Introduction, beginning on page 2);
- d) a generic information retrieval application, communicatively coupled to the user interface/event manager (see disclosure that the system can be applied to a group of documents found by the AltaVista spider, section 1 Introduction, beginning on page 2); and
- e) a data cleaning application for
 - i) decomposing each page of a set of text documents into one or more pagelets (see disclosure that documents are decomposed into shingles, analogous to the claimed pagelets, in section 2 Defining Similarity of Documents, beginning on page 3);
 - ii) identifying all pagelets belonging to templates (see disclosure that common shingles were nearly all mechanically generated, including shared header or footer information on a large number of automatically generated pages, i.e. forms, analogous to the claimed templates, in section 5.1 Common Shingles, beginning on page 7); and
 - iii) eliminating the template pagelets from a data set (see section 5.1 Common Shingles, beginning on page 7, particularly the disclosure on page 8 that common shingles either have no effect on the overall resemblance of the

documents or they have the effect of creating a false resemblance between two basically dissimilar documents, and so common shingles are ignored), communicatively coupled to the generic data gathering application and to the generic information retrieval application.

13. Regarding claim 11, **Broder et al.** teaches an apparatus as claimed, comprising:
- a) a user interface (see disclosure that the system can be used for filtering the results of Web searches, said web searches requiring a user interface, Abstract);
 - b) a user interface/event manager communicatively coupled to the user interface (see disclosure that the system can be used for filtering the results of Web searches, said web searches requiring an event handler to respond to user requests, Abstract);
 - c) a generic data gathering device (see disclosure that the system can be applied to a group of documents found by the AltaVista spider, section 1 Introduction, beginning on page 2);
 - d) a generic information retrieval application, communicatively coupled to the user interface/event manager (see disclosure that the system can be applied to a group of documents found by the AltaVista spider, section 1 Introduction, beginning on page 2); and
 - e) a data cleaning application for
 - i) decomposing each page of a set of text documents into one or more pagelets (see disclosure that documents are decomposed into shingles, analogous to the claimed pagelets, in section 2 Defining Similarity of Documents, beginning on page 3);

- ii) identifying all pagelets belonging to templates (see disclosure that common shingles were nearly all mechanically generated, including shared header or footer information on a large number of automatically generated pages, i.e. forms, analogous to the claimed templates, in section 5.1 Common Shingles, beginning on page 7); and
- iii) eliminating the template pagelets from a data set (see section 5.1 Common Shingles, beginning on page 7, particularly the disclosure on page 8 that common shingles either have no effect on the overall resemblance of the documents or they have the effect of creating a false resemblance between two basically dissimilar documents, and so common shingles are ignored), communicatively coupled to the generic data gathering application and to the generic information retrieval application.

14. Regarding claims 2 and 14, **Broder et al.** additionally teaches a method and computer readable medium as claimed, wherein the set of text documents comprises a collection of HTML pages (see disclosure in the Abstract that the disclosed invention is applied to every document on the World Wide Web, page 1).

15. Regarding claims 3 and 15, **Broder et al.** additionally teaches a method and computer readable medium as claimed, wherein the cleaning step comprises the steps of:

- a) decomposing each page of the set of text documents into one or more pagelets (see disclosure that documents are decomposed into shingles, analogous to the claimed pagelets, in section 2 Defining Similarity of Documents, beginning on page 3);
 - b) identifying all pagelets belonging to templates (see disclosure that common shingles were nearly all mechanically generated, including shared header or footer information on a large number of automatically generated pages, i.e. forms, analogous to the claimed templates, in section 5.1 Common Shingles, beginning on page 7); and
 - c) eliminating the template pagelets from a data set (see section 5.1 Common Shingles, beginning on page 7, particularly the disclosure on page 8 that common shingles either have no effect on the overall resemblance of the documents or they have the effect of creating a false resemblance between two basically dissimilar documents, and so common shingles are ignored).
16. Regarding claims 7 and 19, **Broder et al.** additionally teaches a method and computer readable medium as claimed, wherein the step of identifying all pagelets belonging to templates comprises the steps of:
- a) calculating a shingle value for each page and for each pagelet in the set of documents (see disclosure of the calculation of fingerprint values on the shingles, in section 3 Estimating the Resemblance and the Containment, beginning on page 4);
 - b) eliminating identical pagelets belonging to duplicate pages (see section 5.1 Common Shingles, beginning on page 7, particularly the disclosure on page 8 that common shingles either have no effect on the overall resemblance of the documents or they

- have the effect of creating a false resemblance between two basically dissimilar documents, and so common shingles are ignored);
- c) sorting the pagelets by their shingle value into clusters (see disclosure of the clustering procedure in section 4.1 The Clustering Algorithm, on page 7);
 - d) enumerating the clusters (see disclosure of the clustering procedure in section 4.1 The Clustering Algorithm, on page 7); and
 - e) outputting a representation corresponding to the pagelets belonging to each cluster (see disclosure of the clustering procedure in section 4.1 The Clustering Algorithm, on page 7).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

19. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

20. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Broder et al.** ("Syntactic Clustering of the Web") as applied to claims 1-3, 7, 9, 11, 13-15 and 19 above, and further in view of **Chakrabarti et al.** ("Enhanced Topic Distillation using Text, Markup Tags and Hyperlinks").

21. Regarding claims 4 and 16, **Broder et al.** teaches a system and apparatus substantially as claimed.

Broder et al. does not explicitly teach a system and apparatus wherein the decomposing step comprises the claimed steps.

Chakrabarti et al., however, teaches a system and apparatus wherein the decomposing step comprises the steps of:

- a) parsing each text document into a parse tree that comprises at least one node (see disclosure that each HTML page is a Document Object Model (DOM) tree, p. 210, under section 3 Proposed Model and Algorithms);
- b) traversing the at least one node of the tree (see disclosure that each HTML page is a Document Object Model (DOM) tree, p. 210, under section 3 Proposed Model and Algorithms; see also Figure 4, page 211, illustrating the finished tree wherein pagelets have been pushed to the leaves of the tree; see also section 3.2 Segmentation and Smoothing, page 211);
- c) determining if one of the at least one node comprises a pagelet (see disclosure that each HTML page is a Document Object Model (DOM) tree, p. 210, under section 3 Proposed Model and Algorithms; see also Figure 4, page 211, illustrating the finished tree wherein pagelets have been pushed to the leaves of the tree; see also section 3.2 Segmentation and Smoothing, page 211); and
- d) outputting a representation corresponding to the one of the at least one node if it comprises a pagelet (see disclosure that each HTML page is a Document Object Model (DOM) tree, p. 210, under section 3 Proposed Model and Algorithms; see also Figure 4, page 211, illustrating the finished tree wherein pagelets have been pushed to the leaves of the tree; see also section 3.2 Segmentation and Smoothing, page 211).

It would have been obvious to one of ordinary skill in the art at the time of the invention to decompose an HTML document to arrive at a list of pagelets through the use of a parse tree, since it is important to bring in additional sources of information (like a tag tree structure) where possible, to combat topic drift and clique attacks (see page 210, col. 1, last paragraph).

22. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Broder et al.** ("Syntactic Clustering of the Web") as applied to claims 1-3, 7, 9, 11, 13-15 and 19 above, and further in view of **Rodeheffer et al.** (U.S. Patent 6,614,764).

23. Regarding claims 10 and 12, **Broder et al.** teaches a system and apparatus substantially as claimed, further comprising:

- a) a pagelet identifier, communicatively coupled to the data cleaning application (see disclosure that documents are decomposed into shingles, analogous to the claimed pagelets, in section 2 Defining Similarity of Documents, beginning on page 3);
- b) a hypertext parser, communicatively coupled to the pagelet identifier (see disclosure in the Abstract that the disclosed invention is applied to every document on the World Wide Web, page 1; see also disclosure that documents are decomposed into shingles, in section 2 Defining Similarity of Documents, beginning on page 3);
- c) a template identifier, communicatively coupled to the data cleaning application (see disclosure that common shingles were nearly all mechanically generated, including shared header or footer information on a large number of automatically generated pages, i.e. forms, analogous to the claimed templates, in section 5.1 Common Shingles, beginning on page 7); and
- d) a shingle calculator, communicatively coupled to the data cleaning application (see disclosure of shingle construction, section 2 Defining Similarity of Documents, beginning on page 3).

Broder et al. does not explicitly teach a system and apparatus comprising a Breadth First Search (BFS) algorithm.

Rodeheffer et al., however, teaches the Breadth First Search (BFS) technique (see col. 34, lines 43-62).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a Breadth First Search (BFS) algorithm, since this would produce a spanning tree in which the path from each node to the root is as short as possible, and generally, shorter paths are better. Furthermore, the breadth-first search is also efficient (see col. 34, lines 51-62).

Allowable Subject Matter

24. Claims 8 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

25. The following is a statement of reasons for the indication of allowable subject matter:

The present invention is directed to a system and method for cleaning a set of hypertext documents in order to minimize violations of a Hypertext Information Retrieval rule set, including the steps of decomposing each page in the set of documents into one or more pagelets, calculating a shingle value for each page and pagelet in the document set, clustering the pagelets based upon their shingle value, for each clusters with more than one pagelet finding all hyperlinks connecting pages owning pagelets in the cluster and finding all undirected connected components of a graph induced

by the pages owning pagelets in the cluster, outputting any components with size greater than 1, and finally eliminating these pagelets as being part of a template.

The closest prior art of record, **Broder et al.** ("Syntactic Clustering of the Web") teaches a system whereby the syntactic similarity of web pages are calculated, thus allowing the removal of duplicate elements of web pages. The reference anticipates the claimed decomposition of web pages, calculation of shingle values, clustering, and removal of duplicate or near-duplicate elements and/or pages.

However, **Broder et al.** fails to anticipate or render obvious the recited feature of analyzing the clusters in order to identify components belonging to templates through the links between pages containing the pagelets of the cluster, as in dependent claims 8 and 20.

These features are novel and non-obvious over the prior art of record.

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Broder et al. (U.S. Patent 5,909,677) teaches a method for facilitating the comparison of two computerized documents.

Broder et al. (U.S. Patent 6,119,124) teaches a computer-implemented method of determining the resemblance of data objects such as web pages.

Dean et al. (U.S. Patent 6,138,113) teaches a method for identifying pages that are near duplicates in a linked database.

Broder et al. (U.S. Patent 6,230,155) teaches a method for facilitating the comparison of two computerized documents.

Broder et al. (U.S. Patent 6,349,296) teaches a computer-implemented method of determining the resemblance of data objects such as web pages.

Gomes et al. (U.S. Patent 6,615,209) teaches a duplicate detection technique that uses query relevant information to limit the portions of documents to be compared for similarity.

Pugh et al. (U.S. Patent 6,658,423) teaches a duplicate and near-duplicate detection technique that assigns a number of fingerprints to a given document.

Dean et al. (U.S. Patent 6,665,837) teaches a method for identifying related pages among a plurality of pages in a linked database such as the World Wide Web.

Manber ("Finding Similar Files in a Large File System") teaches a tool, called *sif*, for finding all similar files in a large file system.

Broder ("Some Applications of Rabin's Fingerprinting Method") teaches an implementation and several applications of Fabin's fingerprinting scheme that take considerable advantage of its algebraic properties.

Agrawal et al. ("Fast Algorithms for Mining Association Rules") teaches two new algorithms for solving the problem of discovering association rules between items in a large database of sales transactions.

Brin et al. ("Copy Detection Mechanisms for Digital Documents") teaches a proposed system for registering documents and then detecting either complete or partial copies.

Heintze ("Scalable Document Fingerprinting (Extended Abstract)") teaches an online system that provides reliable search results using modest resources and scales up to data sets of the order of a million documents.

Broder ("On the Resemblance and Containment of Documents") teaches the mathematical properties of resemblance and containment and the efficient implementation of the sampling process using Rabin fingerprints.

Fang et al. ("Computing Iceberg Queries Efficiently") teaches an efficient algorithm to evaluate iceberg queries using very little memory and fewer passes over data when compared to current techniques that use sorting or hashing.

Kumar et al. ("Trawling the Web for Emerging Cyber-Communities") teaches the systematic enumeration of emerging communities from a web crawl.

W3C ("Document Object Model (DOM) Level 2 Core Specification, Version 1.0") is the specification for the Document Object Model.

Davison ("Recognizing Nepotistic Links on the Web") teaches some of the issues surrounding the question of what links to consider and which to disregard when conducting link analysis in query results ranking.

Crescenzi et al. ("RoadRunner: Towards Automatic Data Extraction from Large Web Sites") teaches techniques for extracting data from HTML sites through the use of automatically generated wrappers.

The following references, although not qualifying as prior art, are also of interest:

Bar-Yossef et al. ("Template Detection via Data Mining and its Applications") teaches a practical solution for the template detection problem based on counting frequent item sets.

Haveliwala et al. ("Evaluating Strategies for Similarity Search on the Web") teaches a technique for automatically evaluating strategies for answering Related Pages queries using Web hierarchies, such as Open Directory, instead of user feedback.

Crescenzi et al. ("RoadRunner: Automatic Data Extraction from Data-Intensive Web Sites") teaches a matching technique that automatically generates a common wrapper by exploiting similarities and differences among HTML pages sharing a similar structure.

Laender et al. ("A Brief Survey of Web Data Extraction Tools") teaches a taxonomy for characterizing Web data extraction tools and provides a qualitative analysis and survey of major Web data extraction tools.

Arasu et al. ("Extracting Structured Data from Web Pages") teaches an algorithm that takes as input a set of template-generated pages, deduces the unknown template used to generate the pages, and extracts as output the values encoded in the pages.

Yi et al. ("Eliminating Noisy Information in Web Pages for Data Mining") teaches a noise elimination technique for pages on a web site, wherein a style tree is built to capture the common presentation styles among pages on the web site.

Ma et al. ("Extracting Unstructured Data from Template Generated Web Documents") teaches a system that identifies web page templates and extracts the unstructured data.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke S. Wassum whose telephone number is 703-305-5706. The examiner can normally be reached on Monday-Friday 8:30-5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

In addition, INFORMAL or DRAFT communications may be faxed directly to the examiner at 703-746-5658.

Customer Service for Tech Center 2100 can be reached during regular business hours at (703) 306-5631, or fax (703) 746-7240.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Luke S. Wassum
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